

# EWA 2006 Review

## Preliminary Report of the Review Panel

# Outline

- Positives
- Caveats
- Summary responses to the questions
- Concluding remarks

# EWA Positives

- Continued agreement and cooperation of agencies and stakeholders
- Continued external review of EWA
- Stakeholder involvement in analyses
- 2007 plan
  - not truly adaptive management but an important step in developing ecosystem experiments in the future

# EWA Positives

- Documented approaches
  - Salmon Decision tree
  - Delta Smelt Risk Assessment Matrix
- Use of variable assets
- New and more analyses of data and information (e.g., DCC tagging, Big Mama hypothesis)
- General elevated level of scientific thinking
- Shift in focus from take in early years to life cycle approach

# EWA Positives

- Improved statistical analyses
- Better understanding of the (complex) role of exports
- Considering trade-offs between species
  - Effect of HORB on salmon and smelt
- Link to CALFED Science program
- Finally, excellent materials and presentations at the workshop – thank you

# Caveats

- Preliminary – do not get upset until you see the full report
- Many questions included “environmental water” but insufficient information so our review focuses on EWA

# Question 1

- Has there been enough water in EWA and other environmental programs to enable actions sufficient to *reduce the impacts* of water management on species of concern in the Delta and associated tributaries?

# Response to Question 1

- Yes, with respect to the narrow (take) objectives originally outlined for the program in the ROD
- The panel believes that EWA actions have reduced take at the pumps



# Response to Question 1

- However, there are caveats
  - Reductions in the amount of EWA water available over time, and efforts to reject or modify recommendations for EWA actions undoubtedly compromises its efficacy
  - The panel has not been provided enough information to evaluate the impacts of other environmental water programs (e.g., b2), particularly as they relate to EWA water

# Response to Question 1

- No, in the larger context in which EWA exists today (and some thought was originally created)
- There is not enough water to simultaneously manage habitat and water quality, route salmon through the system, and make delta smelt less vulnerable to export pumping in significant magnitudes

# Response to Question 1

- In this larger context, the panel is certain that more EWA water will be needed as EWA moves into the future
- The panel also believes that measures in addition to reductions in export pumping will be required to recover at risk populations
- Time now for ideas that may involve redesign of the “plumbing”

## Question 2

- Have the EWA and the other environmental water programs *effectively* contributed to the *recovery* of the species of concern in the Delta and associated tributaries?

# Response to Question 2 – b2

- Less analysis of b2 than of EWA – review needed, *especially for integrated environmental water approach*
- Mixed evidence of effectiveness
  - Clear Creek: increased salmon production
  - Stanislaus: decreased salmon production

# Response to Question 2 - EWA

- No recovery of species to date – trick question
- Delta smelt
  - Kimmerer's analysis suggests small positive effects
    - Needs to be vetted and confirmed
  - Question of trade off in take
    - Reductions in one season – shift take (exports) to other seasons and life stages?
- Maybe small positive effects on salmonids – note not for San Joaquin

# Response to Question 2

- In principle, could EWA contribute to recovery?
  - Flexibility needed (tightening?)
  - Enough water (decreasing over time)
  - With other environmental water programs (integration?)
  - Storage and carry-over capabilities needed
  - Increasing knowledge (must continue)
  - Priority of EWA in the mix of water demands (lessening recently?)
  - Patience (years, despite POD panic)
- Caution: engineering fixes to engineered systems are risky

## Question 3

- Are there sufficient information and data from all sources to determine the effects of EWA and other water programs to species of concern (i.e., **populations** of delta smelt and salmonids)?



# Response to Question 3

- Not with sufficient confidence - key to response is “populations” in question
- Improved understanding of take and routing
- Many examples of new (and scientifically exciting) results of analyses, new data, and the merging of information

# Response to Question 3

- Example of a challenge is effects of water year types versus water shaping effects
- But we still struggle to express take (or reductions in take) at the population level for Delta smelt
- Still critical gaps, isolation of EWA effects, and “silo” analyses

# Questions 4 and 5

- Is the current monitoring effort by the agencies sufficient to provide the needed information on population level effects and responses to EWA and other environmental water use?
- If there is insufficient data and information to determine the efficacy of the EWA and other environmental water, what scientific approaches are needed to address the problem to allow that determination?

# Responses to Questions 4 and 5

- The panel commends the agencies for obvious and accelerated progress, and acknowledges the efforts required to make such progress
- It is very clear that much has been learned since the last review
- New thinking and analyses are evident and must continue and accelerate

# Responses to Questions 4 and 5

- Data collection and analyses needs to continue to improve in rigor and scientific discipline
  - Data mining that is not hypothesis driven is discouraged
  - Avoid “regression analyses” mentality, consider statistical assumptions, multicollinearity, conceptual models
  - Power analysis (formal or at least thinking) to determine the size of effects that can be realistically identified, given the data at hand

# Responses to Questions 4 and 5

- The panel feels that it is very important now for the agency and stakeholder groups to close the review (scientific method) loop
- Rectify disparate interpretations (not a single result – hypotheses) based upon results using the same data---this will be extremely important when deciding how to proceed beyond 2008 and to “optimize” EWA effectiveness
- This will require new collaboration among the many agency people and stakeholders, and continued injection of new people

# Responses to Questions 4 and 5

- There are numerous other ways to improve the quality of data collected relative to its quantity, and specific examples will be discussed in more detail in the report.
- Focus on needs identified during development of population models to elucidate cause and effect, and to inform the models

# Responses to Questions 4 and 5

Narrow your targets----

- Amend existing sampling programs to target the distribution and abundance of all life stages of delta smelt in space and time, including delineation of spawning habitat
- Note: Sampling design and stations used for multiple purposes can compromise their value



# Responses to Questions 4 and 5

Narrow your targets----

- Determine to what extent that lack of understanding and quantification of gear efficiencies can mask relationships, inflate uncertainty, and preclude defensible estimates of population size based upon monitoring results

# Responses to Questions 4 and 5

Narrow your targets----

- Others focus areas include but are not limited to:
  - behavior of fish in response to flow
  - improvements in monitoring in real time
  - genetics studies for unequivocal identification of members of specific salmon runs
  - spatial variation in mortality rates of delta smelt and salmon smolts (e.g., delta, CCF, pumping facilities)
  - estimates of entrainment (e.g., smelt larvae)

# Question 6

- What scientific components should be considered while implementing EWA in 2007?

# Response to Question 6

- We interpret this question as a reference to the matrix (pelagic organism actions)
- We will respond in a letter
- We agree with the general approach of describing the actions, their rationale, response variables, etc.

# Response to Question 6

- Not an experiment without proper pre-implementation analyses and multiple years
  - Over interpretation is tempting
  - Population very low
- Bottom line: we cannot answer the five questions posed to the Panel specific to the action matrix with the information provided

# Question 7

- What scientific components and considerations should be included in a future and/or long-term environmental water program? Are there components that could be included to improve our understanding of water management on ecosystem function and species' population dynamics?

# Response to Question 7

- Going in the right direction – but in the opinion of the Panel going too slowly
- Need to move from regressions of bulk variables (e.g.,  $Y/X$  versus  $X/Y$ ) to processes
  - e.g., tracking, organismal questions

# Response to Question 7

- Continue to move from take to life cycle view (e.g., habitat quality)
- Gaming – been 10 years, now add biology
- Right idea to view EWA as part of an Environmental water program
- Requires review of VAMP, B2, etc. like EWA and to integrate them and tools to evaluate their “optimal” use



# Concluding Remarks

- Much progress – much to go
- Pace of learning is accelerating
- Commended for using the peer-review process
- Almost ready to use EWA effectively - optimistic